

1450

THE LEGIBILITY
OF TYPE

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MERGENTHALER
LINOTYPE COMPANY
BROOKLYN
N. Y.

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FOREWORD

WHILE IN MANY FIELDS the frontiers of thought are being projected with apparent disregard for basic facts, it is fitting that the Graphic Arts pause and review certain phases of the past and endeavor to recognize their influence on that which lies ahead.

Reflection never need imply reaction. Permanent progress is the result of the application of experience to new problems. Perhaps an understanding of fundamental truths is needed today more than ever before.

The following pages are devoted to brief considerations of typographic backgrounds and trends, particularly as applied to legibility and incidentally referring to the leadership of the Mergenthaler Linotype Company during nearly a half century.

TYPE WAS MADE TO READ

"Type," said the Foreman, "was made to read,
And that is a maxim it's well to heed,
For the printer frequently gets a start
With a craze for 'beauty,' a bug for 'art,'
Which holds him fast in a fearful gripe
And keeps him trying mad stunts with type,
With seventeen fonts and seventy styles
And borders by thousands and rules by miles.

"Type," said the Foreman, "was made to read,
But the printer, oftentimes, in his greed
For novel features and 'class' and 'tone,'
Forgets this fact he has always known
And sends out work that is fine to see
And 'smart' and 'natty' as it can be,
A job with a swagger and high-bred look,
But hard to read as a Chinese book!

*This verse was written for and
published in the Linotype Bulletin
for March, 1915. It has since*

BY BERTON BRALEY

"Type," said the Foreman, "was made to read,
And that should serve as the printer's creed,
For work on the Linotype machine
Or hand-set jobs should be clear and clean,
Not ornamental, obscure, bizarre,
Composed of all of the fonts there are,
But simple, legible, quiet, plain,
A joy alike to the eye and brain!

"For art in printing is not the way
Of wild extravagance, weird display,
But rather the unobtrusive thrall
Of type that gives you no shock at all,
But draws your eyes to the page with zest
And holds your mind to the thought expressed;
We must keep ourselves to this simple creed,
Type was made—and is meant—to READ!"

*been reprinted (usually without
proper credit) by almost every
printing publication in the world*

THE LEGIBILITY OF TYPE

THE TOPIC OF LEGIBILITY offers many factors bearing directly upon the typographic branch of the Graphic Arts.

An attempt to cover the more important phases would require a book of appreciable size. These would include, in addition to basic type design, the size of type; ornamentation or other embellishment; a discussion of serifs and kerns; quality of paper and its capacity to reflect light; color of inks; and others.

Legros and Grant, in their work *Typographical Printing-Surfaces* (Longmans, Green & Co., London), have contributed authoritatively at considerable length to the subject. However, no pretense is made herein to treat other than briefly upon the more significant phases.

Legibility of type is a matter of consequence to the millions of readers throughout the entire world. An increasing appreciation on their part is manifest in many directions and undoubtedly evinces

the efforts of designers, manufacturers and printers to bring the typographic arts to a high plane of excellence.

Eye specialists, psychologists and others engaged in research, both in the United States and elsewhere, have attempted to approach the subject of legibility of books, newspapers and other publications, along scientific lines. The results, so far as they are known, have failed to establish either unanimity of opinion or practical standards which can be accepted as an actual basis for those who are technically responsible for the products in the Graphic Arts.

The definite factor of eye fatigue is recognized as very real, but so far as is known, no scientific method for its positive measurement, as related to type, has been devised. Psychological tests have proved that eye fatigue is the result of a complexity of nerve reactions while reading. It has been shown that neither large type size alone nor apparent legibility have proved always to be the easiest to read. Pleasing letter design, interesting subject matter and its arrangement play a definite part in both reader acceptance and eye fatigue.

Hence, experience, experiment and common sense continue to be the controlling factors among printers and publishers.

It is an accepted fact that reading is done not by letters, but by groups of letters or word-forms. This is one of the most important premises confronting

type designers. A character rendering, alone by itself, may be legible and pleasing, but when combined with others of the same design may fail to justify the expectations of its originator. Conversely, there have been examples of seemingly faulty character designs which upon being grouped with their fellows have produced satisfactory effects. Notable among such is Caslon, one of the most widely used and popular faces over a long period of time.

A realization of the group form of eye action,

育	臣	云	本	極
邦	教	此	謂	才
普	固	求	及	也
民	以	益	爲	之

*Chinese ideographs retain the character
of rapid brush strokes*

combined with the proper selection of type face for the purpose at hand, the length of lines when set and the adequate spacing between lines constitute to a considerable degree the basis of the legible composition of type.

The determination of line lengths is almost wholly dependent upon the character of work to be done and the size of type to be used, coupled with the ability of the eye to easily encompass the available space. The correct length of line when set in 12-point might well be too long if necessity dictated the use of 6-point type.

The ease with which a modicum of thought can determine the treatment of the problem of line lengths is illustrated below:

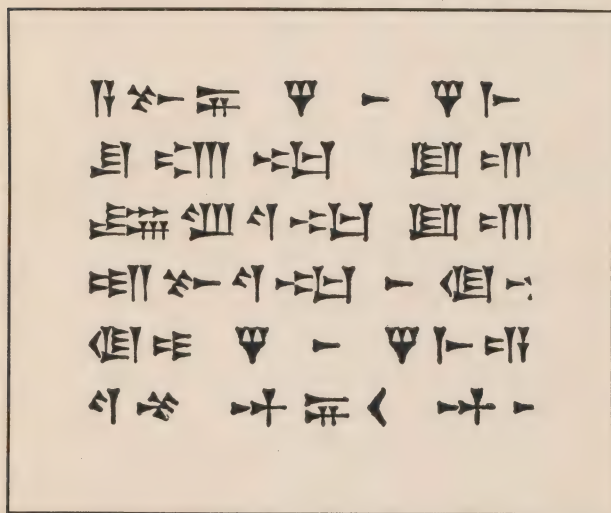
To William Caxton, Mercer of London, we owe the first book printed in the English language, and therefore by the printers of America, equally with those of England, should his name be held in high esteem. There is an appealing touch of human nature in the story of this stolid English merchant, who in his fiftieth year turned aside from his prosperous undertakings to devote himself to learning and practising the new-born art of printing. Caxton was living at Bruges, so well thought of by his compatriots that he had been elected "Governor of the English Nation in the Low Countries," when, to please his patroness the Duchess of Burgundy, he set himself to translate the "Recuyell of the Histories of

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Nevertheless, no hard and fast rule has been set, by means of which the ideal length for each type size can be positively determined. An easy formula is that of a lower-case alphabet-and-a-half for lower-case lines, but this is subject to variations without seriously affecting legibility. Line lengths should be determined by the character of the type face quite as much as the type size, since the same point sizes in various faces are not equally legible in the same measures.

Another factor in the planning and execution of legible typography is that of spacing words in lines.



Cuneiform writing was done in clay with an angular tool

Good taste dictates fairly close spacing between words and this, in most instances, is an aid to easy reading. Four-to-em spaces appeal to many authorities, rather than three-to-em spaces. In such spacing, four-to-em or three-to-em between sentences preserve consistency. Others hold to the thought of three-to-em spacing with either two three-to-em or em spacing between sentences. Either method is productive of satisfactory results.

Line spacing is dictated by good judgment plus proper consideration of space at hand. Some type faces require more space between lines than others of the same point size. An example of this is Caslon Old Face which, because of its shoulder and long descenders, requires less spacing than Bodoni.

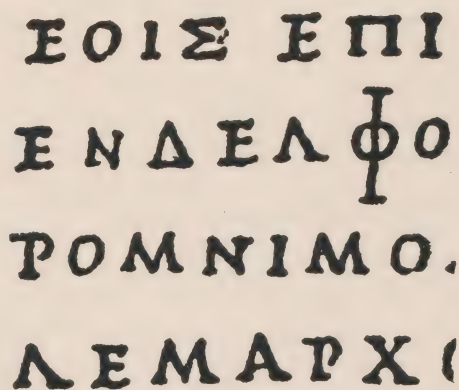
The late Benjamin Sherbow was wont to say that "enough space should be put between lines to make them inviting and easy to read. Stop when this has been done—don't overdo." Merely as a guide, he suggested this leading scheme:

<i>Type Size</i>	<i>Minimum Leading</i>	<i>Maximum Leading</i>
6-point . . solid		1-point
8-point . . solid		2-point
10-point . . solid to 2-point . . .		4-point
11-point . . 1-point		4-point
12-point . . 2-point		6-point
14-point . . 3-point		8-point

Conventional old styles and romans undoubtedly were in his mind when he laid down this guide.

The sans serifs and square serifs require greater spacing to secure legibility and harmony—perhaps to the extent of fifty percent more than usual body types, depending upon the design and length of lines. Considerable latitude is thus permitted to the typographer and his experience plays an important part in the problem.

The comparative simplicity of initials of the present day exemplifies the evolution from the illuminated initials in early manuscripts and books,

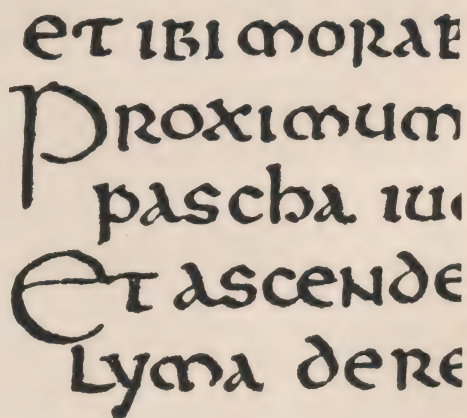


ΕΟΙΣ ΕΠΙ
ΕΝΔΕΛΦΟ
ΡΟΜΝΙΜΟ.
ΛΕΜΑΡΧΙ

*Greek manuscript writing shows the accents
and serifs of the reed*

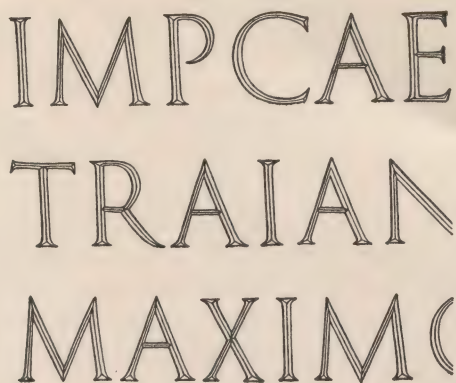
where they were found in their most elaborate form. While decorative initials have a place in certain forms of typography, when perfectly combined with the design of the type, they should be used by lesser artists and typographers with restraint.

Type initials are used solely for the relief of otherwise monotonous areas. When this is accomplished, their purpose is completed. Ofttimes, too great accentuation calls attention to the initial it-



ET IBI MORAE
Proximum
pascha iu
ET ASCENDE
Lyma dere

*Pen-written Uncial letters show the influence
of the pen strokes on type forms*



IMP CAE
TRAIAN
MAXIMO

*Chisel-cut Classic Roman letters from the Trajan
Column—sharp, bracketed serifs*

self, rather than causing it to meld into the form of which it is a part. The selection of the letters to be used, as well as their size, should be made with the purpose of maintaining the feeling of harmony, whether by complete blending or careful contrast.

The position of initials with relation to text matter has been subject to some experimentation, not always with proper consideration to the ensemble effects produced. Conventionally indented initials, aligned at the top, frequently are varied by the use of upright initials, aligned at the base of the char-

The book weight of this Bodoni family provides the paleness of color which is often desirable. How is one to assess and evaluate a type face in terms of its esthetic design? Why do the pace-makers in the art of printing rave over a specific face of type? What do they see in it? Why is it so superlatively

Medium color of the original Bodoni is stronger, of course. It is much used in modern composition. How is one to assess and evaluate a type face in terms of its esthetic design? Why do the pace-makers in the art of printing rave over a specific face of type? What do they see in it?

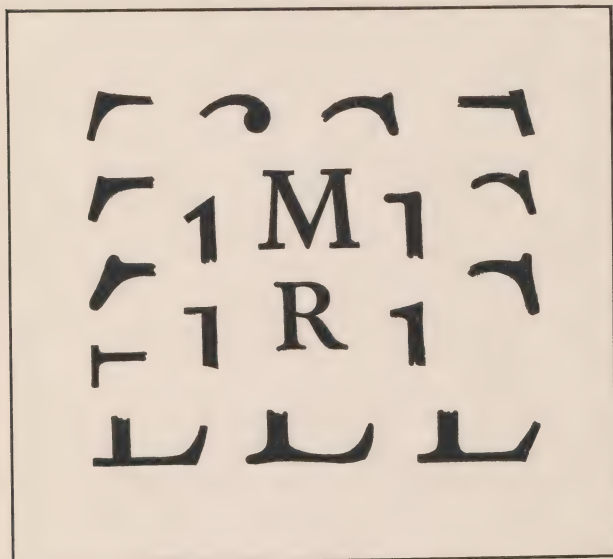
The bold weight for the uses of display and the emphatic contrast of side headings. How is one to assess and evaluate a type face in terms of its esthetic design? Why do the pace-makers in the art of printing rave over a specific face of type? What do they see in

Poster color arrived with modern typography. Black as type can be but still legible. How is one to assess and evaluate a type face in terms of its esthetic design? Why do the pace-makers in the art of

The effect of weight on type design

acters. Upright initials are at times placed in or near the center of first lines of text matter. Such variations of the conventional should be attended with care, both as to positioning and the size of initials chosen.

There are those who will contend that ornamentation seldom adds to the legibility of type matter. Even though this be true, efforts frequently are made to produce pleasing typographic effects through the introduction of ornamental embellish-



Conventional type serifs and weighted strokes are derived from all the foregoing forms

ments. If this be done, in good taste and with restraint, harmful effects may be avoided. A good rule for a printer to follow is to ask himself why he is putting in the decoration, rather than why he is leaving it out. If he cannot give himself an entirely satisfactory answer, he should eliminate it. Probably, the most notable examples of printed matter are distinguished by the dignity of their simplicity.

Reference has been made to the influence of paper and ink upon the legibility of type. While it would be possible to dwell at length upon this subject, the limitations of this chapter will not so permit. The most legible effect is produced through the greatest contrast. For this reason, ink should be perfectly black and dead in color and the paper as white as possible. Concessions to either of these specifications are compromises with legibility and require emphasis upon other factors, either through increased size or additional weight of the face of the type chosen.

Flat surface paper, capable of accepting normal type impression, is an aid to legibility. Rough surfaces necessitate surplus ink and impression, resulting in irregularities, while excessively smooth paper surfaces introduce the factor of reflection. Each of these is a decrement from legibility.

TYPOGRAPHY OF
NEWSPAPERS

FOR YEARS IT HAS been the opinion of many eye specialists that the small type used in some newspapers was a contributing cause of eye fatigue and impaired vision. Readers, particularly those of advanced years, have complained of the difficulty of reading newspapers and have urged that they be set in larger type.

Many publishers of newspapers, however, confronted by the increasing cost of paper, felt that it was not economically practical to change to a larger type which would require them either to print less news or to use more pages.

As the result of studies extending over many years, the type designers of Mergenthaler Linotype Company designed certain new type faces which, while actually taking up no more space and giving more words to the column than the types that had been in general use, appear to be much larger and are more readable.

Ordinary types previously were made up of light

and heavy strokes. In printing, particularly newspaper printing, it is sometimes the case that the light lines tend to break down so that the contour of certain letters is incomplete. This adds to the strain on the eye to distinguish between letters of similar appearance. By strengthening these light lines and making the whole letter slightly heavier, the newer types designed for newspapers print clearly, even on high speed presses, from stereotypes made by the dry matrix processes and with rubber inking rollers—all of which conditions exert trying tests on type.

A further and more important improvement lies in the better distribution of the light spaces in and around the letters. This is exemplified in the various members of the Linotype Legibility Group shown on pages 24 and 25.

The Linotype Legibility Group for newspapers has been developed to meet various conditions—



A typical example of light distribution in and around letters which increases legibility without reducing the "word count." This is a comparison of the Excelsior "e" with another "e"

each with a purpose. The first of these, *Ionic No. 5*, probably enjoys the widest use of any face in the newspaper world and may be considered to be an all-around letter for body matter.

Next came *Excelsior* which was designed to meet the requirements of fast presses, rubber rollers and dry mats. Its popularity was instantaneous, since its design embodied all of the modern legibility factors.

Following this *Paragon* was developed to provide a slightly lighter face while retaining all of the qualities of *Excelsior*. There are newspapers that, because of a preponderance of heavy advertising typography, seek to hold reading columns to a proper weight, while permitting adequate inking of bold display printing surfaces. It was to meet this condition that *Paragon* was introduced.

As a complement to these faces, *Opticon* has been designed. It will exercise exactly the reverse influence to *Paragon*, being heavier and slightly weighting the reading columns where this is desired. Hard finish papers which permit little spread of ink and newspapers carrying a minimum of heavy display find *Opticon* to be a body face that adequately meets such requirement.

During this period of typographic development, *Textype*, the face in which this book is set, was produced as a further alternative in the selection of types for legibility needs.

In dealing with mechanical conditions, it has

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IONIC NO. 5

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EXCELSIOR

The Linotype Legibility Group of newspaper body faces—Ionic No. 5, Excelsior, Paragon and Opticon. Their universal

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PARAGON

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OPTICON

*acceptance is evidence of the increasing
appreciation of publishers of legibility as
a responsibility to their readers.*

who dominated the Georgian era with his unequalled satire, once wrote an "Essay on Man" in which, among other wise things, he said: "Vice is a monster of so frightful mien as to be hated needs but to be seen; yet seen too oft, familiar with her face, we first endure, then pity, then embrace." In these familiar lines is to be found a rational explanation of the apparently causeless popularity of some eccentric type faces.

When first shown to us the inherent viciousness of these so-called "distinctive" faces gives a shock of disagreeable surprise; later on, maybe owing to their tentative use by "the other fellows," they become familiar; finally, this familiarity, breeding not contempt but toleration, tempts us to embrace the very vice that at first repelled. Of course, the novel and strange are not necessarily vicious, and it needs no poetic quotation to determine this. Rather may the point be made clear by an everyday and

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These two columns are identical in every respect except spacing between the lines. The first column is 7½-point Excelsior on an 8½-point slug and the second column is the same type set on 9-point slug. Which is easier to read?

been unnecessary to depart from sound theories of correct design. The Linotype Legibility Group combines legibility and practical printing qualities—a scientific solution to a typographic problem.

Linotype words are separated by means of sliding wedges, known as spacebands, which justify the lines by distributing the word spaces equally. These spacebands are made in several thicknesses, the thinnest of which permit close spacing, which is considered by many students of typography to be more desirable than wider spacing. Other spacebands have wider ranges. Some there are who prefer these.

Line spacing is a subject which permits opportunity for experimentation in newspapers, though confined to exceedingly small limits. The rapid handling of text matter in makeup necessitates solid slugs of predetermined body.

Those publishers who have studied such conditions seldom set a face solid. For example: a 7-point face needs either a 7½-point or 8-point slug body to ensure reader comfort. Some publishers are using 7½-point face on a 9-point body. The trend toward more open spacing attending the “easy to read” movement in newspapers has been marked and is encouraging in its effect upon legibility. No definite rules can be established since fullness of type face, its size and the measure are all factors that should be considered.

Merely casual observation would indicate that

RARE FERN SEEN AT FLOWER SHOW

Plant Like Those 'Hundred
Billion Years Ago' Known as
'Hottentot's Head.'

NEW CARNATION HAILED

Gets Two First
Medal—New
Gardens Re

Rain May Greet Spring Today, Animals at Zoo Catch the Fever

Change the Elephant Finds At
Rosie the Hippo Leads Parade
Tomorrow To Be Fe

From strange
the near
the ancient
thrived on
years ago,
est carnat
rived from
and public
show yest

Spring starts officially today with a
and falling temperatures, with fair skies
The sun will cross the equator at 8:12 a.m.

CONTROL OVER INFLATIONARY BASE IS URGED

Guaranty Trust Declares the
Dollar Devaluation Did Not
Produce Effects Promised

Oratorio Group Sings B Minor Mass of Bach

Prefaces 250th Anniversary
of Composer's Birth With
9th Annual Performance

Jepson Among Soloists
Soprano's 1st Appearance
With Major Choral Group

The Oratorio Society of New York
prefaced today's observance of the
250th anniversary of the birth of
Johann Sebastian Bach with its
annual complete performance
of the mighty B minor Mass last
night in Carnegie Hall. Albert Stoess
led, now in his fourteenth season as
the Society's musical director, com
manded the soloists were Helen Jep
son, Miss Hampton, con

Palestine Medical Center Drive Planned

A campaign to raise \$300,000 for
the building fund of the Roths
child-Hadassah University medi
cal center in Jerusalem, will be
held during the month of April.
The new medical center will be
the first of its kind in Palestine.

DRIVERS IN PAY PARL

more than 150 taxicab dr
iving to represent 7,000 o
100 drivers in the city.
Yesterday at the call of the
Chauffeurs' Union, an affil
the A. F. of L., in an att
establish minimum wage

The comparative legibility of capitals-and-lower case, and all-capitals, is demonstrated in these examples taken from metropolitan newspapers. The headings set in capitals-and-lower case are more easily read than the condensed capitals

Both
ings
Erba
bilit

Los Angeles Printer's Wife Catches Large Swordfish

LOS ANGELES.—Mrs. Robert M. Parker, wife of the senior member of the printing firm of Parker, Stone & Fish, has caught a large swordfish near the pier that required one

E. L. Blake Heads W. Va. Council

HARTTOWN, W. Va.—Edward

N.Y. News Expanding

Has Spent More Than
\$1,500,000 in Year
For New Equipment
And Structures

Spending High But Spending
Was the headline under

phant, Once Journalist,
es in Newspaper Ads

D.—"We believe"

First Lady to Talk At Women's P

Woman's position in mo
society will be discussed b
500 persons prominent
education and pu
a three-day

Sells Book at Keyboard Without Any Manuscript

FERGUS

Weekly Publisher Thinks We Of the Advertising Contr

TOPEKA, Kan.—How the publisher
of a Kansas weekly put the adver
ising contract idea to work for his
publication, "with the satisfaction of
knowing each Monday morning that
we had enough advertising to get
out a good eight page paper," was

advertisers. They
tracts, as they were
reduced rate.
of next tackled
were favorable
were not consid
the contract be
a year's time

BOMBAY LAUDS LINO FOR SETTING OF DEVANAGARI

New Machine and Its Invent-
ors Bedecked with Flow-
ers at Ceremony Presided
Over by Mayor of the City

BOMBAY, India.—The Model 14
Linotype equipped to set Devanagari
—Sanskrit—the alphabet of 300,000—
4000 people in this part of the world.
has won itself "a wreath of bay"

Both sans serifs and flat serifs are popularly used for headings and display. The three upper examples are Memphis. Erbar is shown in the lower specimens. Both combine legibility and strength, and Erbar permits liberal word count

personal tastes, prejudices and traditions find expression in headings to a greater degree than in other phases of newspaper typography. However, definite problems exist which are not confined to these influences. The space allotted for headings and the problem of word count in narrow measures, with the consequent limitation of type faces suitable for the purpose, are not so simple as always to permit wide ranges in selection.

Heading styles have changed to a considerable degree during recent years. Recognition of the greater legibility of capitals-and-lower case over the lines of condensed capitals, which are still widely used, has brought about changes which have been welcomed by readers and students of newspaper typography alike. The continued decisions of judges in competitions of newspaper typography is perhaps the best evidence of the trend in headings. Basically, this is sound. The illustrations offer opportunity for comparisons.

III

THE LEGIBILITY OF MAGAZINES

BROADLY SPEAKING, magazines may be of the illustrated or the "wholly type" classifications—with modifications, to be sure. The typographic technique differs materially.

Among the best of the illustrated group will be found many evidences of an effort to secure proper balances—harmony between the treatment of pictures, display and body matter. Unfortunately, consideration of the latter sometimes is overlooked to the point that it suffers. Frequently, too, it lacks legibility.

Undoubtedly this is unintentional. An art director or layout man often toils to create effects with pictures and headings, only to tell the printer to "go ahead and set the body" in the accustomed type and manner. Many times the style of face has been the same for years back. Perhaps the chief or some editor liked it and possibly it was the best type available for the purpose when it was chosen. But, perhaps it has become the "sacred cow."

Types have changed. Legibility has been increased. Then, too, styles change in body types, as in display letters. Pleasing letters have been designed. A great field exists for better and more legible text composition in the illustrated magazine field, although there are notable exceptions to this observation.

Before proceeding to the "wholly type" magazines, reference should be made to those publications using "type and cuts." Of these there are many, since trade and technical periodicals come within this group. Chapters could be written on this classification of magazines. Since less opportunity exists here for original ideas in arrangement, great care should be given to legibility of body matter and the arrangement of captions in a wholesome and consistent manner.

The magazines that rely upon the subject matter to hold reader interest—that is, "wholly type" magazines—more than any other class of publication, need clear, crisp, well composed type.

Liberal margins, where possible; sizeable type, well leaded; pleasing combinations of publication and book technique; care in the selection of paper; good ink, clean presswork—these factors are necessary to "wholly type" magazines, if the best results are desired.

Too frequently, publishing organizations overlook the good results which can come from a careful self analysis as applied to the typographic cus-

toms in their own magazines. Many times, too, these matters are left to an individual who is instructed to "do it this way" and then left to his or her own resources to handle the recurring issues as they come along. To this type of organization, all too seldom, comes a realization that reader interest can be aroused and maintained through self-questioning in the publication office. (1) Is it legible—easy to read? (2) Is it well composed—pleasing?

Certainly, legibility is of first importance in all magazines, to whatever classification they belong.

IV

EASY-READING BOOKS

WHAT OF the legibility of type used in printing books? The explanation may lie in the answer to another question. Why do some editions of books "read easy" and others of the same text require conscious effort?

Booksellers and librarians are of one voice as to the reactions of buyers and readers of books. With few exceptions, if upon quick or casual examination a book fails to present pleasing or readable pages, some other book possessing these qualities secures preference.

Because of the time required to read most books and the consequent demands placed upon the eyes, legibility is of prime importance. But in addition to being easily read, the type must be pleasing, while at the same time it should not make its presence felt. When the reader becomes conscious of the type in a book, its selection and arrangement have fallen short of its highest purpose.

The choice of the exact face or faces of type best adapted to book printing might easily represent a

very considerable difference of opinion. There are a number which, when properly arranged, would qualify as good type selections. That group of researchers who declared 12-point Scotch, leaded two points, set nineteen picas in width, as being the most legible combination, did not settle the question for all people with finality.

The same aesthetic influences that impel designers to produce pleasing variations in type faces are present also among book producers and readers. If it were otherwise, all books might well be made in standard molds—regimentation, in truth. Fortunately, such is not the case and within practical limitations, books may be composed in numerous faces with reasonable surety of offering legibility and pleasurable reading.

Perhaps one of the best sources of contemporary authority in book type selections is the annual "Fifty Book" selection which has been conducted for the past twelve years by the American Institute of Graphic Arts. While no claim is made that the "Fifty Book" group, selected from some five hundred or more competing editions are the "best" or "most legible," the objects of its sponsors are "to set before the American typographers and publishers the best examples of American bookmaking of the year, models for inspiration and study, examples that might gradually raise our standards of book design and manufacture."

It is suggested that the table showing those Lino-

LINOTYPE FACES—"FIFTY BOOK" SELECTIONS

	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	Total
Caslon Old Face	3	9	12	7	6	6	2	6	1	5	0	2	2	61
Granjon .....	..	..	..	3	1	3	5	5	3	3	11	1	7	42
Baskerville .....	..	..	..	..	..	..	..	0	3	6	3	5	7	24
Original Old Style.....	5	1	0	4	3	1	1	*2	0	2	0	1	0	20
Scotch	1	0	0	2	2	4	3	3	0	1	1	1	0	18
Janson .....	..	..	..	..	..	..	..	0	0	3	1	8	3	15
Bodoni Book.....	0	0	0	1	1	1	2	0	1	1	3	0	1	11
Estienne .....	..	..	..	..	..	..	2	0	1	1	2	2	2	10
Old Style No. 7	0	1	0	1	2	1	0	3	0	0	0	0	1	9
Old Style No. 1	0	0	2	1	0	2	0	0	0	1	0	0	0	6
Garamond .....	..	..	..	0	0	1	0	0	0	1	1	0	2	5
Caslon	0	0	0	0	0	0	0	1	1	1	0	0	1	4
Bodoni	0	0	0	0	0	0	0	0	3	0	0	0	0	3
Parma .....	..	..	..	..	..	..	..	1	1	0	0	0	0	2
Old Style**	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Franklin Old Style	0	0	0	0	0	1	1	0	0	0	0	0	0	2
Cloister	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Elzevir	0	0	0	0	0	0	1	0	0	0	0	0	0	1
DeVince	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Antique No. 1	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Metrothin .....	..	..	..	..	..	..	..	0	0	0	1	0	0	1
Total.....	11	11	14	19	15	20	17	21	15	26	23	21	26	239

Total.....

* Original Old Style with Caslon Old Face caps. ** No designating number given. † Note that four of the faces were not available until 1931; one until 1930, and two until 1927.

type faces which have been represented in the "Fifty Book" awards over a ten year period will afford an interesting study in type face popularity as well as the acceptance of Linotype composed books in this annual blue ribbon book event.

Another great influence upon reading ease is habit. It is conceded that those types which have been read from childhood are the easiest to read. That is, Germans find it easy to read Fraktur or Schwabacher, because they have been accustomed to doing so from youth. English speaking and reading peoples find these letters difficult to read, except after lengthy familiarization.

The same may be said of italics. Aldus set entire books in italics and won considerable acclaim. At a later period other printers began using italics in combination with roman for title and front pages. However, the people had become accustomed to the use of roman letters in text pages and it is a rare instance to find a well composed book set entirely in italics. The habits of readers have been formed.

Text-books form a distinct group apart from other books. There was a time when The Primer must needs be set in type no smaller than eighteen points in size. With the development of legibility of type design, this unwritten law became partially obsolete, but books for beginners require careful treatment.

The mind of the child is sensitive to every im-

pression. School books are a part of his everyday life and he looks upon them unconsciously as mentors. If a page is badly composed, a child, knowing no better, accepts it as a standard and receives an impression which will be difficult to efface.

The substitution of cheap printing processes which use reproductions of typewritten copy by photographic methods is a menace that should be summarily eradicated from all text-books. The book printing profession has evolved a technique that is too well done to permit its birthright to be bartered for a mess of pottage.

Then there are the problems of books of poetry, genealogy, bibliography as well as statistics, indices and other classifications. While these differ in typographic details, in each the unmistakable fundamental requirement is legibility.

V

COMMERCIAL AND ADVERTISING PRINTING

COMMERCIAL PRINTING may be referred to as the product of that branch of the Graphic Arts which specializes in stationery, forms and various kinds of social and advertising printing as contrasted to newspapers, publications and books. Countless books, articles and illustrations have been published for the purpose of educating planners and producers in the styles and technique of this craftsmanship.

The urge for striking effects is responsible for many attempts to originate unusual typography. This is commendable if it be remembered that successful display seldom violates legibility.

Attractive combinations of the many faces of type available today, arranged with or without illustrations or decorations, have instilled into the reading public a fine appreciation for printing as an art. However, not all of the results can be considered as possessing merit, either of legibility or design. Daring departures from the conventional

CAXTON WAS LIVING AT BRUGES, SO W
 Caxton was living at Bruges, so well thought
 of by his compatriots that he had been elected
 "Governor of the English Nation in the Low
 Countries," when, to please his patroness the
 Duchess of Burgundy, he set himself to trans-
 late the "Recuyell of the Histories of Troye."
 The work finished, he found so many friends
 desiring copies that the labor of writing them
 would have been too wearisome. Accordingly
 he made up his mind to learn the new art of

METROTHIN

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METROMEDIUM

*In the departure of serifs, anatomical forms remain. The
 elimination of all serifs reduces legibility (in comparison
 with the reading ease of traditional roman types) and places*

CAXTON WAS LIVING AT BRUGES, SO Caxton was living at Bruges, so well thought of by his compatriots that he had been elected "Governor of the English Nation in the Low Countries," when, to please his patroness the Duchess of Burgundy, he set himself to translate the "Recuyell of the Histories of Troye." The work finished, he found so many friends desiring copies that the labor of writing them would have been too wearisome. Accordingly he made

METROLITE

CAXTON WAS LIVING AT BRUGES, SO Caxton was living at Bruges, so well thought of by his compatriots that he had been elected "Governor of the English Nation in the Low Countries," when, to please his patroness the Duchess of Burgundy, he set himself to translate the "Recuyell of the Histories of Troye." The work finished, he found so many friends desiring copies that the labor of writing them would have been too wearisome. Accordingly he made

METROBLACK

upon form and weight the responsibility for both form and emphasis. The four weights of Metro are shown to illustrate a trend, and not necessarily as a specimen of good legibility

THE WORK FINISHED, HE FOUND SO M
The work finished, he found so many
friends desiring copies that the labor of
writing them would have been too wearisome. Accordingly he made up his mind
to learn the new art of printing in order, as
he says, "that every man might have his

MEMPHIS LIGHT

THE WORK FINISHED, HE FOUND SO M
The work finished, he found so many
friends desiring copies that the labor of
writing them would have been too wearisome. Accordingly he made up his mind
to learn the new art of printing in order, as
he says, "that every man might have his

MEMPHIS MEDIUM

THE WORK FINISHED, HE FOUND SO M
The work finished, he found so many
friends desiring copies that the labor of
writing them would have been too wearisome. Accordingly he made up his mind
to learn the new art of printing in order, as
he says, "that every man might have his

MEMPHIS BOLD

*The swing to wide spread use of square serif types following
the popularity of sans serifs has resulted in a revival of
certain well-known faces and the development of three
weights of Memphis shown above*

should be essayed only when fundamental principles are not violated.

Few printing plants possess resources that permit the purchase of every new type design. For this reason, the choice of type is frequently limited. Assuming that good taste has been exercised in the selection of type faces, the thoughtful compositor can produce highly pleasing results if he observes proper rules of margins, proportion, harmony and distribution of white space. The presence of these qualities will invariably assure legibility.

Styles in type design and arrangement change with comparative frequency. The popularity of sans serif types brought with it a school of design which sought to be known as "modern." In this connection, your attention is directed to the chapter "Typographic Sanity." The postlude of the sans serif era was the square serif vogue, this being a revival of the use of popular nineteenth century faces in modified forms. Accompanying this period of evolution, we are experiencing an attraction to condensed faces, both in gothics and serif types.

Yet, even in this period of what has been not a little typographic confusion, the forms that please most and merit highest rating invariably are those that observe the basic principles of design and arrangement.

Legibility in its best sense, presents the dominant requisite in advertising and commercial printing as in newspapers, magazines and books.

VI

SUBSTITUTES FOR PRINTING

SINCE THE beginning of time, the evolution of all worthwhile things has been accompanied by the introduction of substitutes, many of which tend toward an inferior product with the "just as good" argument. On the other hand, certain substitutes possess merit and these soon assume a rightful place in the scheme of things.

Printing is a basic art and as such has been subject to exploitation and development along many lines that include various methods and processes.

It is not the intent to dwell upon printing press methods and processes except to mention them when applied to typographic discussions. Whether letter-press (relief), lithographic (planograph) or gravure (intaglio) presswork be employed, type-composition is widely used. The problems of type selection and legibility present themselves in most methods of reproduction, whether the printing is done from type or through photographic media and presses of various descriptions. Assuming that the

mechanical press processes are well used, the opportunity and necessity exist for the proper presentation to readers of well composed, crisp and legible type.

Unfortunately, the presence in recent times of various typewritten format appears to be one of the substitutes for proper and pleasing types. Their obvious cheapness carries with them a repulsion on the part of those who are called to endure these substitutes which destines them to be discarded by those persons who are prompted by motives of economy.

It is regrettable to note that in addition to the commercial use of typewritten substitutes for printing types, students and other readers are being compelled to subject their eyes to undue strain. Many manuscripts and text-books have been produced from typewritten copy, photographed in facsimile or reduced size. Thus, this practice has become one of hygienic as well as aesthetic significance.

Since the theme of this book is that of legibility, it is proper to point out very briefly several of the reasons for the absence of this quality from typewriter substitutes for printing.

Because of the mechanical principles embodied in the construction of present day typewriters, the designing of letters possible of use is definitely limited to equal units, regardless of the conventional structure of the characters, be they cap "W" or

France lost its claim to preeminence in the art of printing when Robert Stephens was forced to flee to Geneva, where he and his son Henry carried on a printing business until his death in 1559, and that of his son a few years later. During this time Henry Stevens produced his "Thesaurus," the only important work of that period.

The quest of the Ideal Book, therefore, passed out of France, and was taken up by another Knight Adventurous in the person of Christopher Plantin, in Belgium. He had settled near Antwerp in 1549 as a bookbinder, but six years later he began printing. The early books from his press showed accuracy and excellence of workmanship, but it was his great undertaking of the Biblia Polyglotta which won him his place among the great master-printers.

In 1586 the preaching of Luther had attracted the attention of the Christian world more particularly than ever to the Bible. The Protestants considered it the single basis of their faith, and upon their familiarity with it depended their present and future welfare. It was natural, therefore, that they should attach the greatest importance to the possession of the most authentic edition of the original text. Among the Catholics the effect of this movement was equally felt. The counter-reform, born in the Church of Rome, after the separation of the dissenting sect, did not limit itself to a moral purification, but undertook with great

An example of typewriter page reproduced by photographic means to the exact size printed. The

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What more glorious task, then, could a printer take

*same text has been set in 9-point Textype above.
Which is easier to read? Which is more pleasing?*

The whole duty of typography is to communicate to the imagination, without loss by the way, the thought or image to be communicated by the author. And the whole duty of beautiful ty-

The whole duty of typography is to communicate to the imagination, without loss by the way, the thought or image to be communicated by the author. And the whole duty of beautiful typography is not

The whole duty of typography is
The whole duty of typography is to communicate to the imagination, without loss
tion, without loss by the way,
by the way, the thought or image to be

The question of ease of reading may be easily settled in the above reproductions of actual examples which have been set in Textype for comparison. The fitting of characters which plays such an important part in the design of type letter characters is emphasized in the lower illustration. Typewriter fitting of characters is of necessity entirely absent, since wide and narrow letters must use the same space as capital letters. Space conservation, legibility and beauty are sacrificed in typewriter texts

lower case "l." Since all are thus made identical in width, it is at once apparent that distortion occurs, either through contraction or expansion. So long as the existing typewriter unit system is continued, just so long this distortion will be present, to the discomfort and fatigue of readers, many of whom for generations have been trained to the appreciation of fine type formations and the obvious resultant ease in reading.

Reproductive methods of typewritten characters which employ the principle of stamping into soft metal for printing media can in nowise change the conditions referred to—certainly not favorably and not infrequently continuing the further reduction in legibility.

Other processes introduce photography or transfer media made from original typewritten copy. A few words about this. In the placing of typewriter characters upon paper by means of percussion through an ink ribbon (commonly called "typewriting") the "smudge" principle is introduced which, even under the most perfect conditions, produces ragged and further distorted results. A casual examination through a magnifying glass of copy produced under average conditions shows even more aggravated effects. Thus, typewriter mechanical processes continue to conspire against the long-suffering reader.

But this is just the beginning. Up to this point it is "copy" that is produced. Each step away from

original copy presents opportunity for loss of detail and further distortion, whether by photographic or other methods. As the reduction in size from the original typewritten copy progresses the legibility of the result approaches the zero point; and yet, books, reports and other material are being reproduced in this manner in considerable numbers.

Type of conventional design, too, has been subjected to these shoddy substitute methods of printing with varying degrees of legibility. In no case has it resulted in improvement.

Worthwhile printing merits proper technique. Years of research and the mechanical development of readable and pleasing types have educated the reading public to standards of excellence in type composition and presswork which, it is predicted, will in suitable time cause resentment to change to revulsion from the spurious offerings which are so offensive.

VII

TYPOGRAPHIC SANITY

As the cold gray dawn breaks upon the morning after an orgy of tangled type design, a weary printing industry shakes its aching head and asks, "Whither are we bound?"

The descent was easy; from black to blacker, from fanciful to grotesque, from freaky to freakier, but when we have plumbed the depths, when the tastes of printer, of reader, are all thoroughly debauched, when we have achieved the ultimate in blackness, in illegibility, in riotous disorder—then to seek the return to the brighter regions of calm and ordered sanity; to reaccustom our ink-sated and jazz-jaded senses to a normal scale of values—this is labor, and this is the path that still lies ahead of the users of type.

The wave of reaction against the excesses of the last few years has been inevitable. Throughout the whole mad era, the Linotype organization has pleaded for moderation; for the guiding hand of good taste and good sense in the laudable quest for freshness of expression. In the face of insistent de-

mands from many of its customers for surrender to the vagaries of the moment, it has striven to maintain its policy of typographic sincerity and to issue only type faces of lasting worth.

It would be a simple matter for the Company to design and cut matrices that would sell. It took far more vision to refuse to issue worthless types merely for profit, and instead to present only those faces which are fundamentally sound in design and character and which will be a credit to the publisher who uses them.

The policy is not new with Linotype. It goes back to the very beginning of the Company's typographic activity. This principle has been stated, restated and reiterated. It seems sound and sensible now, because it was sound and sensible when it was announced, and common sense doesn't change with passing years.

In the spring of 1930, TYPOGRAPHIC SANITY was printed as an editorial feature in THE LINOTYPE NEWS. Since that time it has been reprinted in various forms. It is considered to be as pertinent today as when it first appeared

VIII

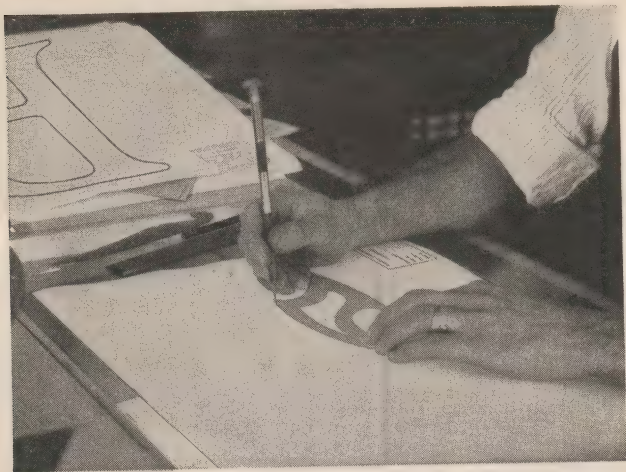
PUTTING THE "B" IN LEGIBILITY

AS A FINAL chapter of this book there has been prepared a graphic tale of embodiment and creation called "The Autobiography of Capital B." In words and pictures the story is told of a matrix from the first letter drawing on paper until it is ready for distribution.

Few printers or publishers who have visited the matrix factory of Mergenthaler Linotype Company, fail to express amazement at what they saw. They realize, often for the first time, that the Linotype matrix is not a stamped-out piece of brass, but the product of mechanical operations which are actually finer and more delicate than many of the operations that go into the making of a fine watch.

The matrix in its final form represents over sixty manufacturing operations alone and must pass through more than half a hundred examinations and inspections before it goes to the printer. If it is not perfect it becomes scrap brass.

To provide the printing trade throughout the



Production of a correct letter demands typographical research and many comparative studies. The letter is drawn on large scale, and even then the work includes dimensions as fine as one-quarter of one-thousandth of an inch

world with Linotype matrices, a stock of more than 125 million finished matrices in seventy different languages is maintained in various centers. This world-wide service demands the use of a factory building eight stories high, of more than twenty thousand square feet each, entirely for Linotype matrix production. Visiting printers and Linotype users have known for generations that they are always welcome at the factory of Mergenthaler Linotype Company, in Brooklyn, N. Y., and at all of its Agencies. But, to the story:

THE AUTOBIOGRAPHY OF CAPITAL B

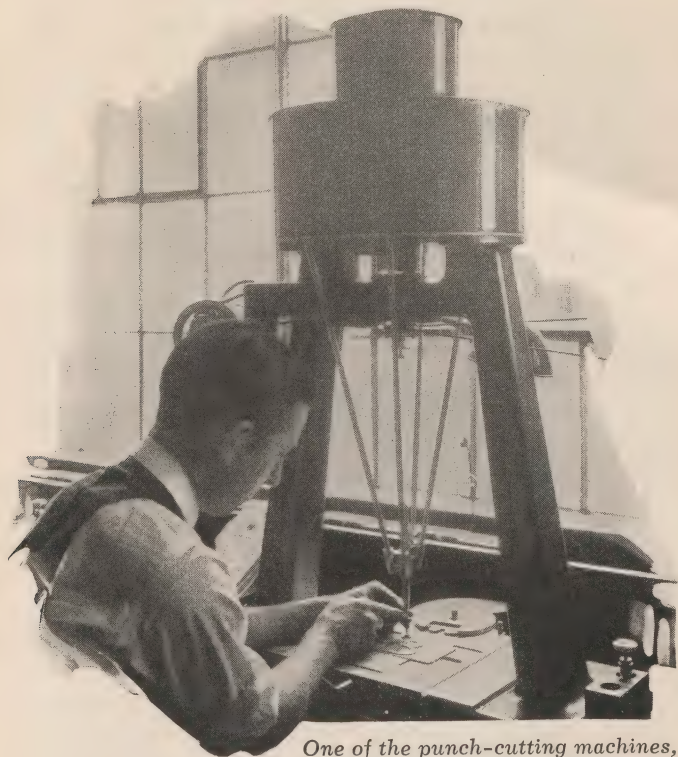
"I AM THE printing press." Forgetting the remainder of this immortal credo, it is a temptation to build a similar philosophy beginning, "I am a Benedictine cap B." But my power to move men depends also on my twenty-five brother letters, so modesty demands that my story shall be in reality the life-story of all other letters that are born in the Linotype factory.

When Messer Plato de Benedictis toiled in his Italian *fonderia*, where he designed and cast the type for his noble books, he would have stared in vast bewilderment had some voice uttered the mysterious words: "Linotype," "Matrix Factory" and "Ryerson Street." Yet these are responsible, many hundred years later, for the reincarnation of us, his children, for the delight of his fellow-craftsmen of the Twentieth Century. Out of the works of de Benedictis, one of these craftsmen, who knew them well, selected certain pages whereon the letters were impressed most clearly. Then, in that Ryerson Street matrix plant, the modern counterpart of our old *fonderia*, images many times enlarged were made of them by photography, and these great



When at last a letter-design has been passed by everybody concerned, it goes to a specially designed device of great accuracy to be transposed into the large brass letter which is to serve as master pattern for making the punch. The picture shows this operation in process

images were studied until the modern craftsmen knew all the little characteristic touches which had made the letters pleasant to the eye in the old Fifteenth Century pages. These craftsmen of today saw and interpreted not only the physical proportions and significances of every stroke but the purpose and the striving of the designer, and bit by bit they set the story down—not in romantic language such as mine, but in sober, dry mathematics, dealing with innumerable infinitesimal dimensions.



*One of the punch-cutting machines,
a triumph of accuracy and precision*

You might suppose that, having so perfect an enlargement by photography, these moderns would find no way so simple and so right as to produce their punches directly from it. But that is not so. Simple it would be. Right it would not be. They

knew that the physical forms of the letters might be so reproduced, but the spirit never. That which was translated from the designer's mind by his hand must be re-translated to the reader's mind by the designer's hand, for in every good type-face there is human spirit, human will, the ineffable something that is man.

Therefore the photographic image and all its accompanying studies were used in the Linotype matrix plant only as the sculptor uses photographs and measurements—to guide and inspire, never to make cold, lifeless duplications.

The photographic enlargements were translated into alphabet drawings. These were on a scale which made the letters several inches high. When the draftsmen had done all they could, photography entered again and they were reduced to exact type size. These reductions were then placed together over and over again with the most painstaking minuteness to get their effect in word-formation. When finally all their exact characteristics had been determined, they went to the matrix drafting room for letter drawing.

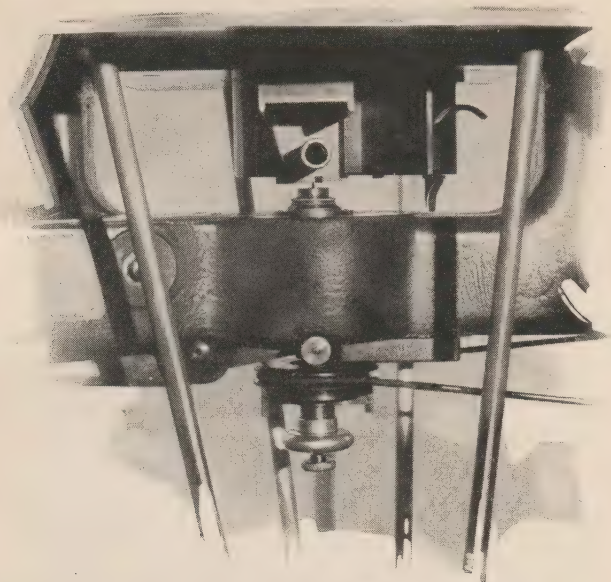
You would have been interested in all the exact information about me that was established in my letter-drawing. The dimensions of Venus de Milo are expressed in feet and inches, but my sinuous curves were delineated in units of one-quarter of one-thousandth of an inch. Three traits that I have in common with my immediate relatives, the thick-

ness of my heavier element, the corresponding dimension of the thinner element, and the general character of my serifs—mathematical references to them all are in “.000.”

My letter-drawing carried other working information: Thickness of side bearings (the white space



The brass letter, or letter-pattern, actual size. The surrounding metal has been routed away, leaving the letter in high and sharp relief. These brass patterns are the master patterns for Linotype faces

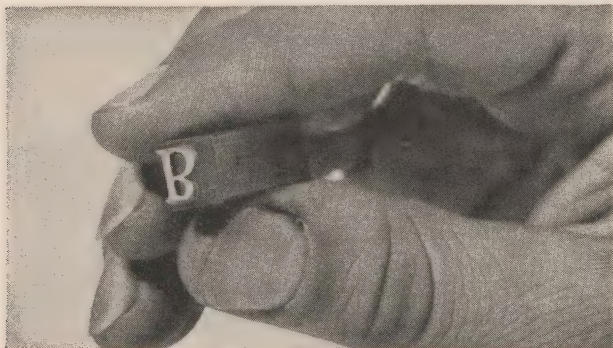


Top of punch-cutting machine. The punch-blank (of annealed steel to make it easy to cut) is in the chuck, which follows every motion of the operator, but reduced automatically to the dimensions of the type that is to be. The cutting tool remains in a stationary position, rotating at a high speed, and cutting not by force, but by immense multiplication of delicate motions

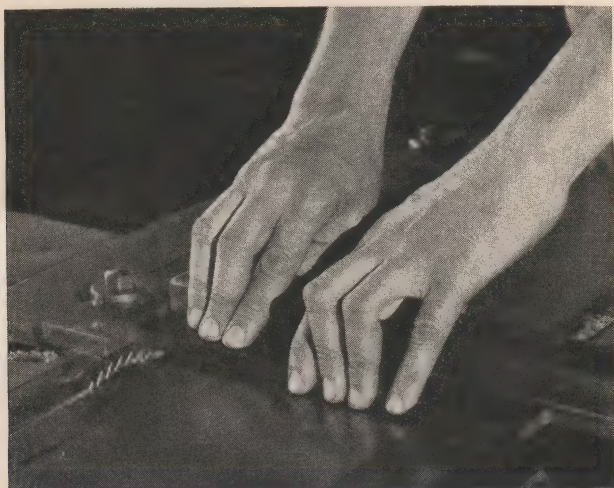
on each side necessary for legibility), the exact point of alignment, the amount by which my top and bottom contours shall extend beyond the normal lines—all this information was worked out on the drafting table after a master mind had schemed the set widths of the letters to make up our font.

As letter-drawings we are filed safely away at Brooklyn for permanent reference purposes. My incarnation started immediately with the approval of the drawing. With a special pantographic device (you know the formula, $x:y::a:b$) I was traced upon a plate of brass with scrupulous accuracy, and then the background was routed away, leaving a plate with a large brass letter in sharp relief. This letter pattern is the real master embodiment of a type. Punches and matrices may be relatively fugitive, but these precise brass patterns permanently and exactly preserve the delineation of the type characters.

My brass pattern went to a picturesque machine designed to regard a fifteen-thousandth part of an



The finished punch. When a punch has passed the system of microscopic inspections and other tests and examinations, it is hardened in an electric furnace, finished by grinding and lapping, and again inspected and tested

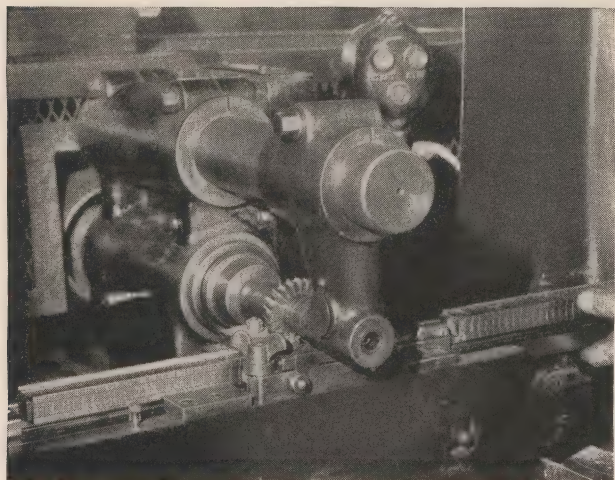


The first of the many operations in making a Linotype matrix is to saw the "block" from bars of high quality brass which has been analyzed for composition and physical conditions and tested for hardness and other qualities

inch as a factor of serious error. Here, with the placing of a piece of soft steel in the upper part of the machine, comes the punch in my story (no pun intended), for this is the famous punch-cutting machine, one of the marvels of modern precision machinery. As the operator's hand follows the brass pattern, the microscopic cutting-tool above him nibbles into the soft steel until finally my handsome form is revealed in full relief and I have become veritably a punch.

Between the punch, and a slug cast from the matrices produced with the punch, there is a minute difference in thickness of lines—another factor in parts of a thousandth to be calculated.

When the punch is pronounced correct (I haven't recounted the inspections and checkings that have passed upon me) it goes into an electric furnace, followed by a plunge into an oil bath. These change the soft, easily cut steel into a punch so hard that it can crush its face into solid brass. The process is simple to watch, but it required the combined wis-



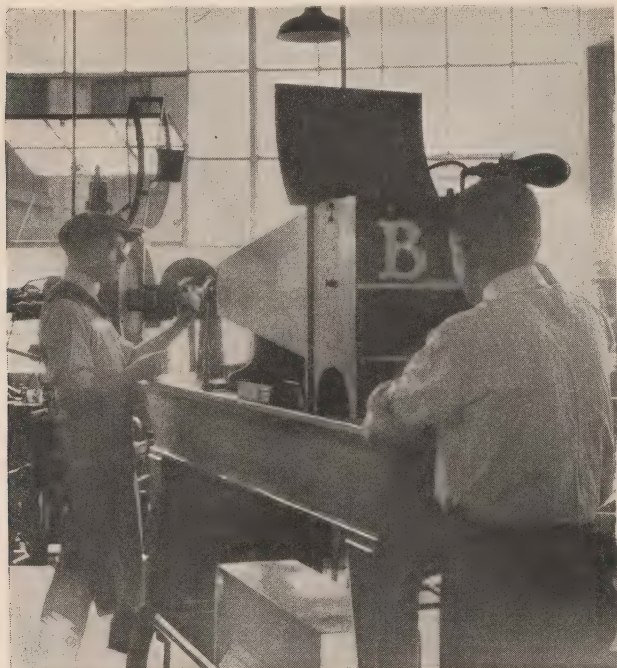
Fifty-six individual mechanical operations enter into the making of the matrix. Here the hard skin of metal is being removed from the surface where the character is to be stamped, eliminating danger of fracture during stamping

dom and experimentation of metallurgists and engineers over years of discouraging effort to arrive at the technique that makes a punch of my size successful. To be exceedingly hard without being brittle—that is a condition that punches and others must meet before they can succeed.

Comes now the stage where I go into quantity production. With me all this time have gone record sheets and cards of information—the U. S. Census people would feel it home-like in the Linotype factory. There are only about 120,000,000 people for the census folks to worry over every ten years. But here in the Linotype factory there are 160,000,000 individual mechanical operations engineered, recorded, and checked every month.

There are, of course, a multiplicity of operations in the stamping, punching, and finishing of a single matrix. Before my punch drives home its character, the general shape of the matrix has been stamped out of brass.

When the blank matrix shape has reached the form where it is ready to be punched, or, as the technical men prefer to call it, stamped, with the character, it reaches a machine whose adjustments have been made with the precision of fine watch-making; for the task of stamping the Linotype matrix is indeed a task demanding the infinitesimal accuracies of watch-making. The character must be punched to the right depth—this controls height-to-paper in the cast slug. It must be punched square



After continual tests and inspections during manufacture, the matrix goes to the projectoscope, which throws a hugely enlarged image on a screen ruled for measurement tests so close that a hair-line shows up fifty times as thick

and true. The location on the matrix must be accurate if the "fitting" of the type is to be perfect. It must also be correctly related to a constant horizontal base line, since some type characters are deliberately punched above or below that line.

In the punching process I develop my multiplex personality, for as many matrices may be punched in any one run as the production order may require. All these punched matrices go on into a series of



Each matrix must pass through more than half a hundred different tests and inspections before it goes out to the trade. In many of these the accuracy required is actually greater than in many operations in the making of a fine watch

finishing processes, constantly inspected. Before a matrix finally gets out into the world, he feels like a be-passported tourist who has crossed every customs zone in Europe.

The finishing processes develop and refine all the complex parts of the matrix. Every face of the piece of brass is machined in one or more ways. Its projecting ears will determine alignment of the character in the casting position on the Linotype. Its varied recesses, notches, and holes all have specific functions and all must be accurate. All the matrices go through instruments which optically project their type character against a constant base line on a ground glass. Other devices measure the depth of drive. Thus are the printing qualities of Linotype slugs safeguarded all through matrix production.

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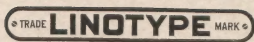
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